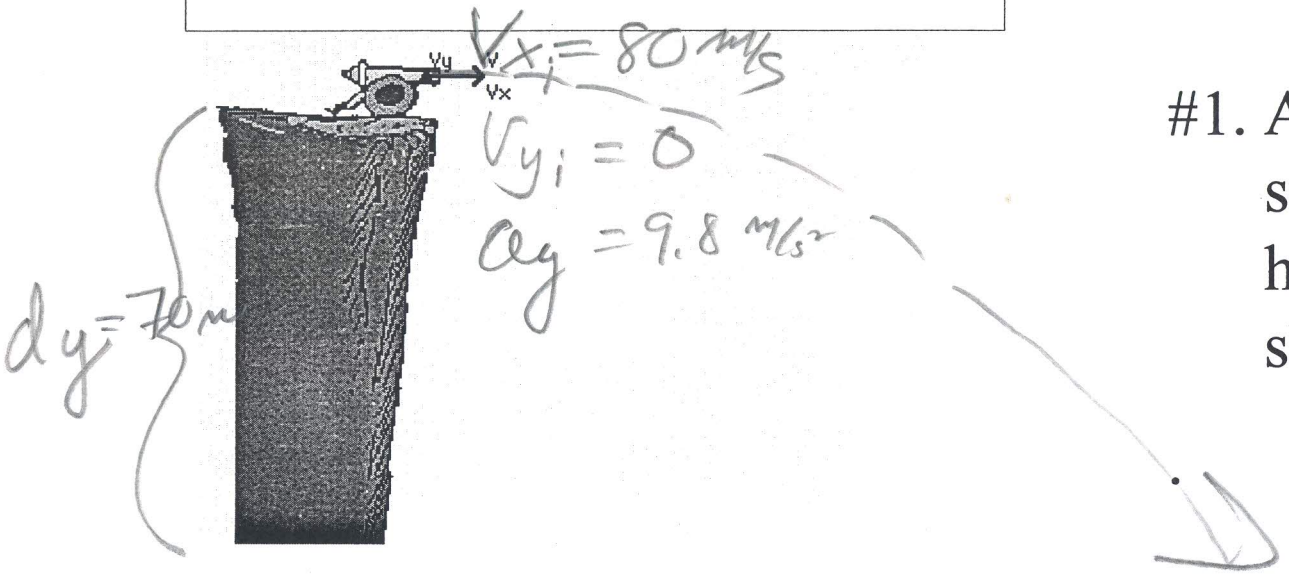
Key

pd 6

Name Me _____ Regents Test 2-D

Kinematics Show all formulas and work



#1. A projectile is fired straight off of a 70 m high cliff at 80 m/s as shown in the diagram

Find

a) the time it takes to hit the ground $d_y = V_{y_i}t + \frac{1}{2}a_y t^2$

3 pts

$t = \sqrt{\frac{70\ m}{4.9\ m/s^2}} = 3.8\ \text{seconds}$ $70\ m = 0 + \frac{1}{2}(9.8\ m/s^2)t^2$ (solve for t)

b) the horizontal distance it will travel

$V_x = \frac{d_x}{t_x}$ so $d_x = V_x t = 80\frac{m}{s} \cdot 3.8\ s = 3.0 \times 10^2\ m \approx 300\ m$ (OR Answer to Part a)

c) The velocity when it hits the ground $V_x = 80\ m/s$ still. We have to find V_y

$V_{y_f}^2 = V_{y_i}^2 + 2a_y d_y = 0^2 + 2(9.8)(70) = 1372 = V_{y_f}^2 \therefore V_{fy} > 37$. NOW PYTHAG THEOREM

80, 37, V_{tot} $\sqrt{37^2 + 80^2} = \sqrt{7769}$

$V_{tot} = 88\ m/s$